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Soil Survey
of
Franklin County, Alabama

By

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United States Department of Agriculture

Bureau of Chemistry and Soils
In cooperation with the
Alabama Department of Agriculture and Industries

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SOIL SURVEY

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SOIL SURVEY OF FRANKLIN COUNTY, ALABAMA

By J. F. STROUD, Alabama Department of Agriculture and Industries, in Charge, and B. H. WILLIAMS and W. W. STRIKE, United States Department of Agriculture

COUNTY SURVEYED

Franklin County is in the northwestern part of Alabama. (Fig.1.) Russellville, the county seat, is about 100 miles northwest of Birmingham. The Mississippi-Alabama State line forms the western boundary of the county which is nearly rectangular in shape, its north-south dimension being about 16 miles and its east-west dimension, about 38 miles. The included area is 647 square miles, or 414,080 acres.

FIGURE 1.—Sketch map showing location of Franklin County, Ala.

About three-fourths of the county is included in the high coastal-plain region, and the remaining, or northeastern, one-fourth comprises the limestone-valley region. The line separating these two physiographic divisions begins on the eastern boundary about 3 miles south of Newburg and extends in a westerly direction to Rockwood and thence northwest to the northern county line. The southern edge of that part of the county included in the limestone-valley region is marked by an irregular crescent-shaped ridge, with a rise of about 100 feet to the coastal-plain region. This ridge overlies the coal measures and is a very noticeable topographic feature in the county. The bluffs, or hills, comprising the rise consist of limestone and sandstone which are covered in many places by coastal-plain material. The west side of the limestone-valley region is marked by a series of high hills and narrow ridges.

The topographic features of the limestone-valley region consist of level, gently rolling, and hilly areas which comprise the smoothest land of the upland part of the county. The streams in this region have not cut deep channels and in many places are only a few feet below the general level of the upland areas. The southeastern corner of the county is hilly and comprises high ridges which have smooth, gently rolling surfaces. The southwestern and western parts are extremely hilly or semimountainous, with very narrow high winding ridges. All the coastal-plain region of the county is much dissected by streams and gullies which have cut V-shaped valleys from 200 to 300 feet below the general level of the smoother plateaulike areas. Numerous rounded hills, narrow elongated ridges, and steep slopes are general throughout this region. In other words, the coastal-plain region of Franklin County is markedly rougher and more broken than typical coastal-plain regions farther south. This condition has probably been caused by the effect of the higher elevations and the

soft unconsolidated coastal-plain material which is easily cut by stream action. In the southwestern and western parts of the county only a few smooth areas occur, and these are mainly on the crests of the ridges.

The general elevation above sea level in the county ranges from about 560 to 950 feet. The northeastern corner has an elevation of 577 feet at Mud Creek Bridge. The elevation at Russellville is 742 feet, at Phil Campbell 1,010 feet, and at Frankfort 741 feet. The highest points are in the southwestern and northwestern parts of the county and in the northern part near the county line.

All the land in Franklin County, with the exception of some of the flat areas in the limestone-valley region and part of the first bottoms, has good or excessive surface drainage, and every farm is connected with one or more drainage channels. No rivers are in the county or bordering it, and drainage is effected through a number of large creeks and an extremely large number of small tributaries. Drainage in the extreme northeastern corner is to the north and northeast, in the southeastern corner to the south, in the southern part toward the west, in the extreme southwestern part, or that part lying south of the Illinois Central Railroad, to the south, and in the northwestern corner to the northwest.

Franklin County was created by the territorial legislature, February 6, 1818, and named for Benjamin Franklin. Its territory was part of the ancient lands of the Chickasaw Indians, although claimed by the Cherokees, and with the final Chickasaw cession of October 20, 1832, the county boundaries were extended westward to the Mississippi line. On February 6, 1867, Colbert County was formed from the northern part of Franklin County.

According to the 1930 census,[1] Franklin County has a population of 25,372, of which 87.6 per cent is rural and averages 34.3 persons a square mile. There are very few colored inhabitants or people of foreign birth. The valley section and the eastern half of the county are the most thickly settled parts, and the southwestern and northwestern parts, which include the roughest areas, are very sparsely settled. The chief towns are Russellville, the county seat, with a population of 3,146; Red Bay, with 1,297; Phil Campbell, with 472; Hodges, with 247; and Vina, with 448. A few small towns, such as Frankfort and Newburg, are not located on a railroad.

The transportation facilities of Franklin County are fairly good. A branch line of the Southern Railway traverses the east-central part from north to south, passing through Russellville, Spruce Pine, and Phil Campbell. A branch of the Illinois Central Railroad enters the western side and runs across the southwestern part through the towns of Red Bay, Vina, and Hodges. The north-central part is farthest from a railroad, but even here the distance is not greater than 12 miles.

There are a few well-graded and graveled roads in the county, the principal one being the Jackson Highway. Within the past year the county has graded and graveled several of the roads connecting with the principal towns and the main roads. The unimproved roads are almost impassable, especially during the winter months

[1] Soil survey reports are dated as of the year in which the field work was completed. Later census figures are given whenever possible.

and rainy seasons. In some sections of the county, especially in the northwestern part, there are practically no first-class roads. Road materials are abundant throughout the county except in restricted areas in the limestone valleys, and roads can be built and surfaced with gravel at a reasonable expenditure.

Russellville and Red Bay are the principal local markets for cotton, corn, and poultry products, and some cotton, crossties, lumber, and staves are sold and shipped from all the railroad towns. The main outside markets are Memphis, Birmingham, and Chattanooga.

Franklin County is well supplied with church and school buildings, and a county high school is at Russellville, Cotton gins are located in all the towns and in some of the rural districts. Local telephone lines with long-distance connections are established between the main towns and throughout most of the county. Rural delivery of mail reaches practically every section. A high-power transmission line crosses the eastern end of the county from north to south, about 4 miles distant from Russellville, Phil Campbell, and Spruce Pine. This furnishes electricity to Russellville and to a Government quarry at Newburg.

CLIMATE

The climate of Franklin County is that of the mild subtemperate zone of northern Alabama, in contrast with that of the subtropical zone characteristic of the counties bordering the Gulf of Mexico, 300 miles to the south.

The mean annual temperature at Newburg is 60.8° F., with maximum and minimum temperatures of 105° and −9°, respectively, or a range of 114°. Below-freezing temperature occurs about 45 days annually, and the annual snowfall averages 6.6 inches. Snow may remain on the ground for several days, and the soil may freeze to a depth of 2 or 3 inches. Snow and freezing temperatures are considered of benefit in diminishing insect ravages, especially the boll weevil. Although winter nights may be cold, the midday temperatures are warm and the percentage of sunshiny days is great.

Winter weather commonly passes through a sequence, beginning with a rain or snow, followed by clearing and colder weather, frost, brisk winds, gradually warming days and nights, and increasing humidity, to be followed again by precipitation.

Winter rains more frequently occur as general rains coming from the southerly or Gulf regions, and storms of marked severity are seldom experienced. Although the rainfall is well distributed and usually ample for all crops, dry periods of short duration may occur. September, October, and November, the crop ripening and harvesting period, are the driest months, and cotton and corn are normally harvested with only minor losses. March, April, and May are the wettest months, with a combined average of 16.71 inches of rain. The rainfall of spring often comes in the form of quick showers and sudden severe thundershowers, which result in gullying and damage to unprotected fields. Winter damage is lessened by slowly falling general rains, by snows, and by freezing of the soil.

The dates of killing frosts vary considerably both in spring and fall. The average length of the frost-free season is 193 days, from April 6 to October 16, inclusive, but frost has been recorded at Newburg as late as April 21 and as early as September 28. The long

growing season is ample to ripen all crops, and it allows the growth of two annual crops at times. Differences of more than 450 feet in elevation govern the occurence of frosts to a marked degree. In the low valleys the growing period is markedly shorter than in the broad uplands around Phil Campbell or the narrow winding ridges between streams. Crops of sorgo and sweetpotatoes frequently suffer some injury from early frost on bottom lands when crops on higher land escape injury.

Winter vegetables such as mustard, collards, cabbage, radishes, and onions, frequently suffer severe damage unless given protection on freezing nights. Wheat, oats, rye, vetch, and bur clover may at times suffer damage, especially from high winds, when in a frozen condition.

The average wind velocity is about 5 miles an hour. The greatest air movement is in the spring and the least in summer. The prevailing winds are from the north in winter, from the south in spring, from the southwest in summer, and from the northeast in autumn. High winds are rare and do little damage. The night breezes of summer favor comfort in sleeping, although the daily air movement is low and the humidity, high.

Tables 1 and 2 are compiled from the records of the Weather Bureau stations at Newburg and Tuscumbia, respectively. Newburg is about 12 miles east of Russellville within the county, and Tuscumbia is about 20 miles north of Russellville in Colbert County.

TABLE 1.—*Normal monthly, seasonal, and annual temperature and precipitation at Newburg, Ala.*

[Data from 1892 to 1903, inclusive.]

Month	Temperature			Precipitation			
	Mean	Absolute maximum	Absolute minimum	Mean	Total amount for the driest year (1894)	Total amount for the wettest year (1892)	Snow, average depth
	°F.	°F.	°F.	*Inches*	*Inches*	*Inches*	*Inches*
December	43.7	79	1	5.38	4.50	4.48	0.5
January	40.4	79	−8	4.83	5.63	4.78	1.9
February	42.8	78	−9	4.72	5.33	5.48	2.3
Winter	42.3	79	−9	14.93	15.46	14.74	4.7
March	52.1	85	6	7.58	5.31	5.27	1.9
April	60.6	92	27	5.89	4.37	13.20	0
May	69.6	96	37	3.24	2.02	3.59	0
Spring	60.8	96	6	16.71	11.70	22.06	1.9
June	76.5	105	40	4.31	2.37	2.14	0
July	79.6	105	50	4.90	4.35	9.55	0
August	78.2	104	50	5.86	5.92	9.40	0
Summer	78.1	105	40	15.07	12.64	21.09	0
September	72.5	102	30	3.78	2.81	4.59	0
October	61.2	93	24	1.53	.61	.35	0
November	52.6	87	11	3.23	1.35	3.93	(1)
Fall	62.1	102	11	8.54	4.77	8.87	(1)
Year	60.8	105	−9	55.25	44.57	66.76	6.6

[1] Trace.

TABLE 2.—*Normal monthly, seasonal, and annual precipitation at Tuscumbia, Colbert County, Ala.*

[Elevation, 488 feet]

Month	Temperature			Precipitation			
	Mean	Absolute maximum	Absolute minimum	Mean	Total amount for the driest year (1904)	Total amount for the wettest year (1892)	Snow, average depth
	°F.	°F.	°F.	Inches	Inches	Inches	Inches
December	42.4	74	7	4.94	5.73	3.73	0.7
January	41.0	76	−6	4.57	2.73	4.75	1.2
February	42.4	80	−8	4.63	1.41	5.58	.9
Winter	41.9	80	−8	14.14	9.87	14.06	2.8
March	52.4	87	17	5.68	7.42	4.36	[1]
April	60.9	90	26	4.75	3.43	16.07	[1]
May	69.3	100	36	3.70	3.63	3.72	0
Spring	60.9	100	17	14.13	14.48	24.15	[1]
June	77.3	107	48	4.20	3.37	5.22	0
July	79.9	104	57	4.16	3.49	8.57	0
August	78.7	102	53	3.82	2.02	5.30	0
Summer	78.6	107	48	12.18	8.88	19.09	0
September	72.9	99	39	2.89	2.99	3.86	0
October	61.2	92	27	2.66	.33	.38	[1]
November	50.4	81	12	3.05	4.07	5.95	.1
Fall	61.5	99	12	8.60	7.39	10.19	.1
Year	60.7	107	−8	49.05	40.62	67.49	2.9

[1] Trace.

AGRICULTURE

Agriculture has been the primary interest in Franklin County since its first settlement, and practically all the better farm land is or has been at some time under cultivation. The areas first selected for agriculture were the "red lands" of the limestone valleys, and after these lands were occupied settlement extended into the higher hilly country. The limestone land supported a natural growth of oak, hickory, walnut, pine, poplar, cedar, and other trees, and the more sandy lands of the coastal-plains section were forested with shortleaf pine, together with a mixture of hardwoods. Practically all the merchantable timber, which has furnished considerable revenue since the early settlement of the county, has been cut.

Most of the land farmed at present is in the limestone valleys in the northern part of the county, in the hill country in the southeastern and southern parts, and on the broad stream bottoms. Extensive areas of extremely rough land in the western half of the county, and smaller areas elsewhere are too rough and broken for agricultural use.

The census reports for the year 1880 show 1,357 farms in the county, about 60 per cent of which were operated by their owners. Corn was grown on 21,038 acres in 1879, yielding 348,897 bushels; oats, on 3,020 acres, yielding 23,143 bushels; wheat, on 1,660 acres, yielding 7,331 bushels; and cotton, on 10,368 acres, producing 3,603 bales. These data indicate the agricultural development that had taken place since the early settlement.

According to the census of 1890 there were 30 less farms in the county, the acreage devoted to grain crops had decreased slightly, and the acreage planted to cotton had increased but the yield had declined. Between the census years of 1890 and 1900 agriculture in the county increased greatly, the number of farms increasing from 1,327 to 2,239. Corn was grown on 32,891 acres in 1899, yielding 428,840 bushels, and cotton on 18,113 acres, producing 6,047 bales. The number of apple and peach trees had increased more than fourfold. By 1910 there had been a steady increase in the number of farms, in the acreage devoted to the staple crops, in the number of minor crops grown, and a considerable increase in dairy products, poultry products, and hay crops.

At present the agriculture consists of the production of cotton and corn as the principal crops, and of hay, sorgo cane, dairy products, poultry and eggs, and livestock as secondary products.

According to the 1925 census, corn, the leading crop, was grown on 37,789 acres in 1924, yielding 501,348 bushels. This crop is used primarily for home consumption and for the feeding of work animals, hogs, and cattle. Some of the corn is sold locally to farmers who grow no corn but raise cotton almost exclusively.

Cotton is the second crop in acreage and is the main cash crop of the county. The 1925 census reports cotton grown on 21,166 acres in 1924, producing 8,289 bales. Practically all the cotton is sold to local dealers.

The less important crops are coarse forage crops, legumes cut for hay, grains cut green, cultivated grasses, oats, wheat, sweetpotatoes and yams, and sorgo cane. The value of all cultivated crops in 1924 was $1,894,666, dairy products were valued at $129,493, and poultry and eggs at $127,900. The value of all livestock in the county on January 1, 1925, was $630,418. No commercial orchards are in the county but a few apple and peach trees are seen on nearly every well-established farm.

Lumber, crossties, and staves furnish considerable revenue, especially in the rougher parts of the county, and considerable brown iron ore is mined throughout the limestone-valley section. Hauling crossties, lumber, staves, and iron ore furnish employment to a large number of farmers when not engaged in farm work.

The farmers recognize to some extent the adaptation of soils to crops. Corn is grown on all soils, indiscriminately, throughout the county, and cotton is grown on all the upland soils and to some extent on the higher bottom lands, although many of the farmers prefer the gravelly loams for cotton. It is recognized that the first-bottom soils are well suited to corn and they have been used almost exclusively for this crop. It is also recognized that the lower slopes, swales, and first-bottom lands are the best for sorgo cane. No definite crop rotation is practiced.

Most of the farmhouses are small, many of them unpainted, and some of them in a bad state of repair. The barns are small, many of them being simply cribs, shelters, and pens. The average farmer owns a few 1 or 2 horse plows, smoothing harrows, a cotton planter, and a 1 or 2 horse wagon, and some have a stalk cutter, mowing machine, fertilizer distributor, grain drill, hayrake, and cultivator. Tractors are used on a few farms for breaking the land. A stock law is in effect over the county, and all the pastures are fenced. The

average value of all property a farm as given in the census of 1925 is $1,867, of which the land represents 63.8 per cent, buildings 18.5 per cent, implements 5.2 per cent, and domestic animals 12.5 per cent. The average value of farm land in that year was $14.32 an acre.

The 1925 census reports a total expenditure for fertilizer for the year 1924 of $98,288 on 2,319 farms, or an average of $42.39 each. Many farmers buy and mix their own fertilizer. The mixture generally consists of 200 pounds of superphosphate (acid phosphate), 100 pounds of nitrate of soda, and 25 pounds of muriate of potash or 100 pounds of kainit. Others use ready-mixed fertilizers consisting of a 3–9–3,[2] 4–8–4, or other mixture of about the same grade. Cotton is generally fertilized at the rate of from 400 to 600 pounds an acre.

The 1925 census reports the average size of farms as 83.2 acres, of which 35.6 acres is improved. The largest farms are in the limestone valleys where a few of them include more than 500 acres. According to the 1925 census 23.3 per cent of the land area in this county is classed as improved land. In those parts of the county where tillable lands lie adjacent to or are a part of rough or stony areas it is necessary for a farmer to control from 200 to 300 acres in order to have 30 or 40 acres of farming land. In the northeastern and north-central parts of the county several thousand acres are held by mining companies, and in the western part large tracts are held by lumber companies. These lands are mostly nonagricultural.

The percentage of farms operated by owners in 1925 was 50.1 per cent and by tenants 49.9 per cent. Of the 1,354 tenant farmers in the county in 1925, cash tenants numbered 162, croppers, 265, and other tenants, 927. Most of the farm labor is done by members of the family.

Land values vary widely. The farming land in the limestone valleys sells at prices ranging from $25 to $75 an acre, the price of the best land in the hilly sections ranges from $10 to $40 an acre, and in the rougher parts of the county the cut-over lands unsuited to agriculture can be bought for $2.50 to $5 an acre.

SOIL SERIES AND TYPES[3]

In soil mapping and classification, soils which have common characteristics, such as color, structure, and origin, have been grouped in soil series. The soil series are divided into soil types on the basis of the texture of the surface soil, that is, the proportion of the different-sized particles composing the surface soil material. Minor differences and variations in the soil type are designated as phases of that type.

The soils have been classified in 13 soil series, including 20 types and 2 phases of types, in addition to 1 undifferentiated series of soils and 2 classes of miscellaneous soil material.

In subsequent pages of this report the soils are described in detail, and their agricultural relationships are discussed; their distribution and location are shown on the accompanying soil map; and their acreage and proportionate extent are shown in Table 3.

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[2] Percentages, respectively, of nitrogen, phosphoric acid, and potash.

[3] Franklin County joins Lawrence County on the east. Along the boundary line the soil map of Franklin County does not agree with that of Lawrence County, which was made several years ago. This is owing to changes in correlation resulting from a fuller understanding of the soils of the State. Atwood loam, Hartsells stony loam, and Dewey fine sandy loam of Franklin County join Ruston fine sandy loam, Hanceville stony loam, and Decatur clay loam, respectively, of Lawrence County.

TABLE 3.—*Acreage and proportionate extent of soils mapped in Franklin County, Ala.*

Type of soil	Acres	Per cent	Type of soil	Acres	Per cent
Atwood loam	41,024	12.0	Kalmia fine sandy loam	3,072	0.7
Hilly phase	8,896		Cahaba fine sandy loam	1,088	.3
Atwood gravelly loam	54,656	13.2	Huntington silt loam	3,456	.8
Savannah loam	15,424	3.7	Ochlockonee silt loam	4,352	1.1
Red Bay loam	2,176	.5	Ochlockonee fine sandy loam	5,248	1.3
Decatur clay loam	3,648	1.6	Abernathy silty clay loam	1,984	.5
Mined phase	2,688		Hartsells very fine sandy loam	3,072	.7
Dewey loam	20,288	4.9	Hartsells stony loam	10,176	2.5
Dewey fine sandy loam	2,688	.7	Guin soils, undifferentiated	160,832	38.8
Dewey gravelly fine sandy loam	20,480	4.9	Rough stony land	24,448	5.9
Colbert silt loam	12,096	2.9	Meadow	3,648	.9
Colbert clay	4,480	1.1	Quarries	256	.1
Colbert fine sandy loam	1,728	.4			
Hollywood clay	2,176	.5	Total	414,080	

ATWOOD LOAM

The surface soil of Atwood loam in wooded areas consists of 1 or 2 inches of brownish-gray or dark-gray loam, containing a small amount of organic matter, underlain by mellow and friable light brownish-yellow or grayish-yellow loam extending to a depth of 10 inches. This layer contains a high percentage of very fine sand and silt. In most places it is underlain by a 2 to 4 inch layer of brownish-yellow friable and crumbly very fine sandy clay, which constitutes a gradational zone between the surface soil and subsoil. The subsoil, extending to a depth ranging from 24 to 30 inches, is reddish-brown, yellowish-brown, or, in places, yellowish-red friable clay or heavy very fine sandy clay. The material is friable and crumbly, breaking up easily, and it is uniform in color except for faint mottlings of yellow and streaks of red. Below the typical subsoil is yellow, brown, or reddish-brown, mottled with yellow and purplish red, clay which is compact and hard but very brittle, and when crushed it breaks easily into irregular lumps. The yellow mottlings are more pronounced in the lower part of the layer. At a depth ranging from 50 to 60 inches mottled yellow and reddish-brown hard compact fine sandy clay is reached.

In cultivated fields the surface soil to a depth of 4 or 6 inches ranges in color from yellowish gray to brownish gray. In a few places the surface soil is light brownish-yellow fine sand underlain by reddish-brown loamy fine sand. Such areas represent the deepest and the lightest-textured soil mapped as Atwood loam. The subsoil in such places is reddish-yellow friable fine sandy clay or very fine sandy clay.

Over a large part of Atwood loam in the southeastern part of the county a crust composed of fragmental angular and platy ferruginous sandstone or iron, the fragments ranging from about one-half to more than 2 inches in diameter, overlies heavy light-gray clay streaked or banded with yellow. In some places in this section numerous sandstone conglomerates occur. A few rounded quartz gravel are present on this soil, especially in areas in the extreme northern, southwestern, and western parts of the county.

Atwood loam occurs in large areas in the southeastern corner of the county, and many small areas are scattered throughout the western part. Some of the largest areas are in the vicinity of Chestnut Ridge, Union Hill Church, West Store, Oak Grove, and along the Lawrence County line.

The surface relief is nearly level, gently rolling, or rolling, and some of the moderately broad hills and elongated ridges are occupied by

this soil. All the land has good natural surface drainage, and on the more sloping areas not protected by terraces the run-off is rapid with resultant erosion. Internal drainage is good, although in some areas movement of water through the subsoil is retarded to some extent by the presence of a hard compact layer.

About 90 per cent of Atwood loam is under cultivation. Cotton is the principal crop, but enough corn is grown by most farmers to supply farm needs. The hay crops consist principally of soybean and pea-vine hay. The acre yield of cotton ranges from one-fourth to 1 bale, depending on the season, preparation of the land, and kind and amount of fertilizer applied. The better farmers use a fertilizer mixture consisting of 200 pounds of superphosphate, 25 pounds of muriate of potash, and 100 pounds of nitrate of soda, applied at a rate ranging from 200 to 600 pounds an acre. Acre yields of corn range from 10 to 25 bushels, the higher yields being obtained where a top-dressing of about 100 pounds of nitrate of soda is applied. Oat yields range from 15 to 25 bushels. The average yield of soybean or pea-vine hay is between one-half and three-fourths ton an acre.

This land sells at prices ranging from $10 to $30 an acre, depending on the location and improvements.

Atwood loam is an early soil, easy to handle, and it responds readily to fertilization. It is low in humus and is in need of protection from leaching and erosion. The growing and turning under of winter cover crops, such as vetch, Austrian winter peas, or rye, would greatly increase the productivity of the soil.

Atwood loam, hilly phase.—The surface soil and subsoil of Atwood loam, hilly phase, are practically the same in color, texture, and structure as the typical soil, but the hilly soil differs essentially from Atwood loam in surface relief, drainage conditions, and susceptibility to erosion. Soil of the hilly phase occurs in the southwestern part of the county, the largest areas being south of Red Bay, south of Center Point Church, around Vina, and in several other places.

This hilly soil occupies the crests of the high ridges, occurring as long, narrow winding strips, and it heads some of the smoother slopes bordering the natural drainage ways. The surface relief ranges from rolling to hilly and broken. All of Atwood loam, hilly phase, is exceptionally well drained, in fact, most of it is excessively drained, and where the steeper slopes are not protected by terraces or forest, erosion is destructive.

Probably 20 per cent of the land is under cultivation. The same crops are grown, fertilizer practices are the same, and crop yields are practically the same as on the typical soil. Much of this land, particularly the steeper slopes, should remain in forest.

Table 4 gives the results of mechanical analyses of samples of the surface soil, subsurface soil, and subsoil of typical Atwood loam.

TABLE 4.—*Mechanical analyses of Atwood loam*

No.	Description	Fine gravel	Coarse sand	Medium sand	Fine sand	Very fine sand	Silt	Clay
		Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
416858	Surface soil, 0 to 1 inch	1.2	4.3	7.9	16.7	6.4	44.3	19.3
416859	Subsurface soil, 1 to 8 inches	1.0	5.2	9.7	19.9	6.8	40.0	17.3
411860	Subsoil, 8 to 28 inches	.5	3.6	7.3	15.1	5.7	31.9	35.9
416861	Subsoil, 28 to 50 inches	.6	4.1	8.4	15.7	6.8	13.2	51.2
416862	Subsoil, 50 to 60 inches	.3	2.2	6.9	34.4	12.2	7.1	36.8

ATWOOD GRAVELLY LOAM

The surface soil and subsoil of Atwood gravelly loam are similar in color, texture, and structure to Atwood loam. The gravelly loam is separated from the loam on account of the content of rounded quartz gravel in both the surface soil and the subsoil. The gravel content differs from place to place, ranging from about 10 to 40 per cent of the soil mass.

Included with this soil as mapped are areas of Savannah gravelly loam which has a somewhat lighter-colored surface soil than Atwood loam and is underlain by brownish-yellow or yellowish-brown fine sandy clay. The gravel content is similar to that in Atwood gravelly loam. Atwood gravelly loam occurs south and west of Russellville. The included Savannah gravelly loam occurs mainly in the vicinity of Phil Campbell.

The greater part of these soils occupies hills with gently sloping or rolling sides, but in some areas the relief is undulating. Drainage ranges from good to excessive, and terraces are necessary on the slopes to prevent destructive erosion.

The greater part of Atwood gravelly loam can be cultivated, and about 80 per cent of it is now used for the production of general farm crops. Cotton is the principal crop and occupies about 85 per cent of the cultivated area; corn is next in importance, occupying about 10 per cent; and the remainder is used for growing peanuts, peas, hay crops, and potatoes. The same cultural methods are used on this soil and the yields of all crops are practically the same as on Atwood loam. Where the gravel content is the highest cultivation is not so easy as on the loam.

SAVANNAH LOAM

The surface soil of Savannah loam in virgin or wooded areas consists of about 2 inches of gray loam, containing a small amount of organic matter, underlain by pale-yellow or grayish-yellow loam extending to a depth ranging from 6 to 10 inches. The subsoil is brownish-yellow or yellow clay or very fine sandy clay, being friable, crumbly, and of uniform color. At a depth of about 26 or 28 inches, this material is underlain by a layer of mottled light-gray, yellow, and rust-brown compact slightly laminated hard but brittle very fine sandy clay from 4 to 6 inches thick. Underlying this is mottled reddish-brown, yellow, and light-gray slightly compact but friable very fine sandy clay material which becomes more friable and crumbly at a depth ranging from 50 to 60 inches. In some places a thin seam or iron crust is present at a depth ranging from 2 to 3 feet below the surface. This compact stratum, as well as the so-called hardpan layer, interferes materially with the movement of moisture throughout the soil.

In cultivated fields the surface soil is gray or brownish gray, depending on the amount of organic matter present. In places the surface soil is 12 or 15 inches deep, but on the slopes where surface washing has been active, the soil is only a few inches deep and in places the upper part of the subsoil is exposed.

The largest areas of Savannah loam are west of Spruce Pine, south of Hodges, and north of Red Bay, and many smaller bodies are scattered throughout the southern half and western part of the county.

Areas of this soil are nearly level, gently rolling, and rolling. Surface drainage is thorough over all the land and is excessive on

slopes and rolling hillsides. Internal drainage is good, although the occurrence of the partly cemented hardpan layer interferes to some extent with the internal movement of soil water.

About 85 per cent of this soil is cleared and cultivated, and the remainder supports a growth of shortleaf pine, blackjack oak, Spanish oak, post oak, white oak, chestnut oak, hickory, sweetgum, black gum, and a few other hardwoods. Broom sedge, Lespedeza, hurrah grass, and various other coarse weeds and grasses spring up in the cleared fields and furnish fairly good grazing during the spring and summer.

The crops grown on Savannah loam are practically the same as on Atwood loam, cotton being the principal crop. The same kind of fertilizer is in general use on this soil as on the Atwood soils, and the yields obtained from all crops are about the same as those on Atwood loam, with the possible exception of cotton which yields somewhat lower on this soil under present methods of cultivation and fertilization.

Land of Savannah loam currently sells at prices ranging from $10 to $20 an acre, depending on location and improvements.

Like Atwood loam this soil is in need of large amounts of vegetable matter which can be supplied by growing and turning under winter cover crops, together with summer legumes interplanted with the corn.

Table 5 gives the results of mechanical analyses of samples of the surface soil, subsurface soil, and subsoil of Savannah loam.

TABLE 5.—*Mechanical analyses of Savannah loam*

No.	Description	Fine gravel	Coarse sand	Medium sand	Fine sand	Very fine sand	Silt	Clay
		Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
416853	Surface soil, 0 to 2 inches	0.5	5.2	14.9	12.6	2.1	49.3	15.4
416854	Subsurface soil, 2 to 8 inches	.7	5.2	14.7	13.0	.8	49.2	16.4
416855	Subsoil, 8 to 26 inches	.9	4.3	10.6	8.8	1.4	45.5	28.4
416856	Subsoil, 26 to 32 inches	.8	4.6	13.1	11.1	1.8	42.7	25.9
416857	Subsoil, 32 to 60 inches	1.0	5.3	15.7	13.8	2.0	24.5	37.7

RED BAY LOAM

The surface soil of Red Bay loam in wooded areas consists of a 2 to 4 inch layer of dark-brown fine sandy loam, carrying a small amount of organic matter which gives the material a slight loamy feel, underlain to a depth ranging from 6 to 10 inches by mellow and friable reddish-brown or light-red loam which, in turn, grades into a layer of rather heavy but fairly crumbly and friable reddish-brown clay loam from 2 to 4 inches thick. The subsoil, which extends to a depth ranging from 6 to 10 or more feet consists of red or very dark-red rather heavy and stiff fine sandy clay which readily breaks into irregular-shaped lumps and finally crumbles easily to a fine-granular structure. The color of the subsoil material is uniform along the breakage lines and across the soil particles, and a cut surface is light red. The subsoil grades below into a yellowish-red hard and compact fine sand or fine sandy clay layer, 2 or 3 feet thick, which readily crumbles and has no definite structure, and below this is yellow or reddish-yellow compact fine sand.

In cultivated fields the surface soil to the depth of cultivation is red or reddish-brown loam. In a few places, where the light surface

material has been washed off, red fine sandy clay, or so-called "gall spots," occur. Included with this soil as mapped and occurring about 1 mile southwest of Mountain Home Church, is a small body of Orangeburg sandy loam, in which the surface soil ranges from gray to brown loamy fine sand and the subsoil is crumbly and friable red fine sandy clay.

Red Bay loam is developed principally in the southwestern corner of the county, several fair-sized bodies occurring along the Illinois Central Railroad, between Red Bay and Vina, and south of the railroad between these towns.

This soil occupies the higher areas in the locality in which it occurs. The surface relief is level or gently rolling, and all areas lie favorably for farming purposes. The land is naturally well drained both on the surface and internally.

Practically all the Red Bay loam is cleared and under cultivation. It has been farmed almost continuously since settlement of this part of the county and is considered the best soil in this locality. Cotton is, and has been, the principal crop, and the clean cultivation of this crop has not allowed the accumulation of any organic matter in the soil. The yield of cotton ranges from about one-third to three-fourths bale an acre, with a possible average of one-half bale in fair seasons. Where the soil is given thorough preparation and from 400 to 600 pounds of high-grade fertilizer are used, the yields are higher. Corn yields from 15 to 25 bushels, the higher yields being obtained where an application of nitrate of soda is applied or barnyard manure is used. Sorgo, sweet-potatoes, and other crops give fair returns under present methods of handling.

Land of the Red Bay loam sells at prices ranging from $25 to $40 an acre, depending on improvements.

Red Bay loam is capable of being built up to, and easily maintained in, a high state of productivity. The soil in its present condition is deficient in organic matter, or humus, and this can be supplied by the growing and turning under of green-manure crops, such as velvetbeans, soybeans, vetch, and crimson clover, or by the addition of barnyard manure. This soil should be plowed a little deeper each year until a fine mellow seed bed from 8 to 10 inches deep has been obtained. The addition of organic matter, together with deep plowing, will enable the soil to absorb more rain water and to hold a larger amount of soil moisture for crops over a longer period. The soil is mellow and easily cultivated, and improved farm machinery can be used advantageously.

DECATUR CLAY LOAM

The surface soil of Decatur clay loam in wooded areas consists of a 2 or 3 inch layer of dark reddish-brown heavy loam, carrying a noticeable amount of organic matter which gives the material a loamy texture, grading into reddish-brown clay loam which extends to a depth ranging from 6 to 10 inches. When dry the soil material is mellow and friable, but it is sticky when wet. The subsoil to a depth ranging from 4 to 8 or more feet is rather heavy and stiff deep-red or maroon-red clay which under normal moisture conditions breaks into irregular-shaped lumps and finally crumbles readily into subangular soil particles ranging in diameter from one thirty-second to one-fourth inch. The color throughout the subsoil is uniform where the clay is broken up, but the cut surface shows a lighter-red color

and faint streakings of black. This typical subsoil grades into a layer of friable and crumbly red clay, 2 or 3 feet thick, which passes into mottled or streaked reddish-brown and yellow rather compact but friable material. Throughout the soil profile are numerous small rounded soft iron or manganese pebbles, ranging in diameter from one-sixteenth to one-fourth inch, which are most numerous in the upper part of the subsoil. A few smooth rounded chert or quartz gravel occur in the surface soil and subsoil in a few places.

In cultivated fields the surface soil to a depth ranging from 4 to 6 inches is dark reddish-brown or red clay loam. Locally the clay loam surface soil has been removed by erosion, exposing the heavy red clay. In a few other places the surface soil contains a noticeable amount of fine sand in the first few inches, particularly where this soil grades into other soils.

Decatur clay loam occurs in isolated areas in the limestone valley extending from Russellville to Newburg on both sides of the State highway, the largest single areas lying about 2 miles south of Russellville, and 2½ miles northwest of Newburg.

Areas of Decatur clay loam range from almost level to gently rolling, with here and there some low hills which have smooth rounded tops and gently sloping sides. Natural surface drainage is good, the rain water running off more readily than from the surrounding loose open-textured soils, and internal drainage is good for a soil as heavy in texture as this.

Nearly all the land is cleared and under cultivation. It once supported a heavy growth of cedar, oaks, hickory, and other hardwoods. Cotton and corn are the principal crops, and the minor crops grown are oats, hay, and sorgo. Some farmers plant cowpeas or soybeans with corn to improve the soil. The average acre yield of cotton is about one-half bale, the yield ranging from one-fourth to 1 bale or more, depending on the season, amount and kind of fertilizer used, and method of handling the soil. Corn yields from 20 to 40 bushels an acre, and it is seldom fertilized. Oats yield from 25 to 50 bushels and soybean or pea-vine hay, from 1 to 1½ tons.

Decatur clay loam land brings from $30 to $80 an acre, depending on location and improvements.

Decatur clay loam is naturally one of the strongest soils in Franklin County, and there seems to be no reason why this soil can not be built up to produce larger crops and maintained in a high state of productivity if properly handled. Both the surface soil and subsoil retain plant food well and respond readily to manure and commercial fertilizer. The soil should be plowed deeper year by year until the seed bed has attained a depth of 8 or 10 inches. Like other soils in the county the land has been cropped to cotton over a long period of time, and it is now deficient in organic matter which can be supplied by barnyard manure, or preferably by the growing and turning under of green-manure crops, such as velvetbeans, soybeans, cowpeas, vetch, rye, and clovers. These crops would not only supply the needed nitrogen and humus but would render the soil more loamy in character, making it easier to till and causing it to retain a much larger amount of the rainfall necessary for the production of larger crops.

Decatur clay loam, mined phase.—Decatur clay loam, mined phase, represents what was at one time Decatur clay loam heavily charged

with brown iron ore. Most of the surface soil and subsoil in many places has been removed, exposing a deep-red heavy clay. Where the surface material did not contain a percentage of ore high enough to be worked profitably for ore, it was dumped around into mounds or ridges. In other places, where the ore was distributed to considerable depth, excavations have been made and big holes left to a depth of more than 20 feet.

The largest area of this material lies immediately south of Russellville and extends northeasterly for a distance of about 4 miles. In the present condition of the land there is no uniformity in the surface material, and the soil can not be classed as an agricultural soil. The numerous excavations intermixed with the mounds and ridges and the otherwise hilly character of the original soil present a very uneven surface.

After this material has undergone considerable weathering, vegetation springs up, and in all probability these areas will become reforested.

DEWEY LOAM

To a depth ranging from 1 to 3 inches the surface soil of Dewey loam in forested areas consists of brown or dark-brown fine sandy loam or loam containing some organic matter, and in a few places it is covered by a shallow veneer of leaf mold. This layer grades into light-brown or slightly reddish brown mellow and friable loam extending to a depth of 6 or 8 inches. The subsoil is typically friable and crumbly reddish-brown clay of uniform color extending to a depth ranging from 24 to as much as 45 inches. The clay breaks easily into irregular-shaped lumps and crushes into a fine granular mass. This material grades into hard and brittle material which has not been thoroughly weathered and oxidized and is very variable in color, texture, and structure, the color ranging from yellow to brown with dingy-white mottlings and red streaks. A few small rounded soft black oxide of iron concretions are present in the upper part of this layer and in the subsoil.

In cultivated fields the surface soil to a depth of 6 or 8 inches is light-brown or reddish-brown loam. In places, where some surface wash has occurred, red or reddish-brown heavy loam or clay loam is found. A few patches have a shallow covering of heavy fine sandy loam to a depth of a few inches. Adjacent to areas of the Colbert soils the subsoil is heavier and is yellowish brown or reddish yellow, mottled with red, gray, and white. Where these variations occur the soil is looser, more friable, and easier to cultivate than typical Decatur clay loam, and only the heavier spots puddle when plowed too wet, and they bake on drying.

Dewey loam is the principal farming soil in the limestone valleys of Franklin County. The largest areas lie between Russellville and Rockwood, around Isbell, and thence east to the county line, especially around Newburg, and small areas are scattered throughout the limestone valleys.

The surface relief of the greater part of this soil is gently rolling and of the remainder is undulating, or almost level over small areas. The soil occupies slightly higher positions than the Colbert soils and lower positions than the Decatur soils. The land is naturally well drained and does not wash except in the high areas and on knolls, and here gall spots are of frequent occurrence. The soil absorbs rainfall readily and maintains a good moisture supply for growing crops.

Practically all of Dewey loam is under cultivation. The original forest consisted of various oaks, hickory, poplar, walnut, and shortleaf pine, but this has been cut. Very little waste land is included in this soil, and it is considered one of the best farming soils in the county, is easily worked, and responds readily to manure and fertilizers.

The principal crops are cotton and corn. The acre yield of cotton ranges from about one-third to 1 bale or more, depending on the season, amount of fertilizer applied, and destruction by insect pests. Cotton is fertilized with from 400 to 600 pounds of a 3–9–3 mixture. Some farmers buy ready-mixed fertilizers but many of them buy the bulk materials and mix it themselves, using the formula recommended by the State experiment station, which consists of 200 pounds of acid phosphate, 25 pounds of muriate of potash, and 100 pounds of nitrate of soda. Corn produces from 12 to 25 bushels an acre, with an average of about 18 bushels. Where stable manure is used or where an acre application of about 100 pounds of nitrate of soda is made the yields are larger. Some oats and small fields of sorgo, peas, and beans are successfully grown, and one farmer has demonstrated that this soil will produce good yields of alfalfa. Garden vegetables, potatoes, and some fruit are produced for home use. Bermuda grass and Lespedeza do well on this soil and furnish good pasture.

Farms on Dewey loam sell at prices ranging from $25 to $50 an acre depending on improvements and nearness to markets.

This soil is well adapted to general farming and dairying, and crop yields can be greatly increased by better preparation of the land, by deeper plowing, by the addition of barnyard manure, or by turning under green-manure crops. Winter cover crops, such as rye or vetch, can be grown. A rotation including leguminous crops or hay crops would improve the producing capacity of the soil.

DEWEY FINE SANDY LOAM

The surface soil of Dewey fine sandy loam in wooded areas consists of a 1 or 2 inch layer of brown or grayish-brown fine sandy loam, containing a small amount of organic matter and underlain by yellowish-brown or light-brown fine sandy loam to a depth of about 6 inches, where it is underlain by a 1 or 2 inch layer of yellowish-brown loam or heavy fine sandy loam. The subsoil is yellowish-brown or reddish-brown clay which has about the same structural characteristics as the clay underlying Dewey loam and which extends to a depth of 3 or 4 feet, where it is underlain by mottled or streaked yellowish-brown, gray, or white material. It is probable that the light sandy material forming the surface soil was washed or blown on the residual clay from the sandstone soils.

In cultivated fields the surface soil is brownish gray or light brown to a depth of about 4 inches. The subsoil in some of the lower-lying areas, especially where this soil adjoins the Colbert soils, is heavier in the lower part and is yellow with white mottling.

This soil is of very small extent in the county, occurring in only a few areas, mainly in the extreme northeastern part. The largest bodies are in the vicinity of Mud Creek School, north of Bethsaida Church, and on the south side of Cedar Creek south of Russellville. The surface relief is gently rolling in some areas, and in other places the soil occupies low ridges with fairly smooth tops. All the land is well drained except in some marginal areas along the lower slopes.

Most of this land is cleared and farmed. Cotton and corn are the main crops, and the yields of these and the fertilizers used are similar to those on Dewey loam. The soil is very easy to cultivate and responds readily to fertilizer and manure. It is well suited to general farm crops, garden vegetables, potatoes, soybeans, peas, and peanuts. This is the best trucking soil in the limestone valleys.

DEWEY GRAVELLY FINE SANDY LOAM

Dewey gravelly fine sandy loam is the most variable soil in the county as regards the color and depth of the surface soil and the content of gravel. Following is a description of an average development of this soil: In wooded areas the surface soil, to a depth ranging from 1 to 4 inches, is grayish-brown fine sandy loam containing a small amount of organic matter. This layer grades into brownish-yellow or very light-brown fine sandy loam extending to a depth of 15 inches. On the surface and distributed through the soil layers is a large amount of smooth rounded quartz and chert gravel, ranging from about one-fourth inch to an inch or more in diameter and constituting from 20 to 75 per cent of the soil mass. The subsoil ranges from yellowish-brown through reddish-brown to red clay. It is rather heavy, breaking into irregular-shaped lumps, has a rather coarse granular structure, and contains some angular and semirounded chert and quartz gravel. It is hard and brittle when dry and sticky when wet. This material extends to a depth ranging from 50 to 60 inches below the surface where it grades into yellowish-brown clay mottled with soft white chert particles.

A shallow variation in areas of this soil has a brown or slightly reddish-brown surface soil from 4 to 8 inches deep in cultivated fields, and these areas contain a higher percentage of chert than the areas of deeper soil. The deepest variation of this soil has a grayish-brown surface soil extending to a depth of a few inches, underlain by brownish-yellow fine sandy loam which extends to a depth ranging from 20 to 30 inches. Such areas contain a higher percentage of rounded quartz and smooth chert particles than the areas of typical soil. The subsoil of the shallowest variation is redder, heavier, and contains less gravel than the subsoil of the deepest variation. Owing to the intricate mixing of the typical soil and its variations in the field, it was practically impossible to make separations on the soil map.

This is one of the extensive soils of the county, occupying a large area in the north-central part. It is most extensive northwest of Russellville, and west and southwest of Frankfort. A large area is north of Russellville, and small bodies are scattered throughout the hilly parts of the limestone valleys.

Areas of Dewey gravelly fine sandy loam are rolling or hilly and they comprise a series of knolls, hills, and ridges, which present a very choppy and uneven surface. Many of the knobs are rounded and have rather steep but smooth slopes. Surface drainage of this soil ranges from good to excessive. The soil warms up early in the spring and is never water-logged. It seems that the large amount of gravel on the surface and mixed with the soil has prevented a great deal of erosion, but in many places gullies have formed.

Probably 50 per cent of the land has been cleared and is under cultivation, and the remainder supports a forest growth of pine,

together with a mixture of different hardwoods common to the county, but practically all the merchantable timber has been removed. Some slopes that were once cultivated are now abandoned.

Cotton is the principal and practically the only crop grown on this soil. The acre yields range from about one-fourth to three-fourths bale, depending on the season, amount of fertilizer used, and damage from insect pests, but damage from boll weevil is not generally so great as on the more poorly drained and lower-lying soils. Practically the same kinds of fertilizers are used on this soil as on Dewey loam. Small fields of corn are grown by nearly all farmers, but not enough corn is produced to supply the farm needs.

Prices of Dewey gravelly fine sandy loam range from $10 to $25 an acre.

Recommendations suggested for the improvement of Dewey loam will apply equally well to this soil, and, in addition, terracing is strongly recommended. Under present agricultural conditions cotton is probably the most profitable crop that can be grown, as it fruits well and matures early. The steeper slopes should be left in forest or reforested.

COLBERT SILT LOAM

The surface soil of Colbert silt loam in wooded areas consists of about a 1-inch layer of dark-gray silt loam, containing a fairly large amount of organic matter or having a thin veneer of leaf mold, underlain to a depth of about 6 or 8 inches by mellow, friable yellowish-gray silt loam of somewhat single-grain structure. The material contains a few small soft black iron concretions ranging in diameter from about one-sixteenth to one-eighth inch. Below this layer and extending to a depth ranging from 10 to 14 inches is yellow heavy silt loam much stiffer than the layer above but much more friable than the one below. The true subsoil, extending to a depth ranging from 20 to 30 inches, is yellow or brownish-yellow clay or silty clay. The material is plastic and impervious when wet, and stiff and hard when dry, cracking badly and finally breaking into coarse angular lumps. A few soft iron concretions and white specks are noticeable in this layer which is uniformly weathered and grades into dull-yellow, mottled with white and rust brown, clay or silty clay as heavy as the layer above. With increase in depth the material assumes a light-gray or white color with yellow and rust-brown mottlings. Some soft lime accretions and black iron accretions are present. The limestone rock is reached in most places at a depth of more than 4 feet below the surface.

In cultivated fields the surface soil, to a depth ranging from 4 to 6 inches, is yellowish-gray material, bleached on the surface to light gray or almost white in the more poorly drained areas, but on the higher parts it is light brown or brownish yellow as it approaches the Dewey soils. The subsoils of some of the higher-lying areas contain red mottlings at a depth ranging from 18 to 24 inches, and at a greater depth the mottles change to brown or gray.

Colbert silt loam is most extensive in the northeastern corner of the county where large areas occur north and east of Mud Creek School. A large number of small areas are scattered thoughout the limestone valleys east and southeast of Russellville. This soil occupies areas with flat, level, or very gently rolling surface relief. Some areas occur as slight depressions and here the surface is uniformly

flat and level. Natural surface drainage is poor, and, owing to the heavy plastic character of the subsoil, internal drainage is extremely slow. On some of the flatter areas and in depressions rain water escapes mainly through evaporation after the surface soil has been thoroughly saturated. This alternate wetting and drying of the soil is largely responsible for the gray color and variable mottlings throughout the areas.

From 5 to 10 per cent of Colbert silt loam is under cultivation. A considerable acreage is fenced and used for pasture, but very little of the land has been cleared. The forest growth consists of pin oak and water oak, growing mainly in the flatter areas, and red, Spanish, blackjack, and post oaks, hickory, elm, locust, redbud, cedar, sweetgum, black gum, dogwood, and old-field pine.

The cultivated areas are used mainly for corn, although a little cotton is grown on the higher-lying areas or those having the best surface drainage. Yields of these crops are low in comparison with yields on Dewey loam. Sorgo cane gives fair returns.

Colbert silt loam sells at prices ranging from $8 to $15 an acre, depending largely on the character of the forest growth.

Colbert silt loam is, as a whole, in need of drainage. Much of the land would be difficult to drain with a reasonable expenditure, but where this can be accomplished, grass, such as Lespedeza, Bermuda grass, and carpet grass, would furnish good pasture for cattle. This soil can be improved by the addition of lime and organic matter. The more poorly drained areas are probably best suited to forest and summer pasture.

COLBERT CLAY

The 1-inch surface layer of Colbert clay, in wooded areas, consists of dark grayish-brown heavy silt loam, containing a small amount of vegetable matter. Between depths of 1 and 3 inches the material is yellowish-gray, mottled with rust brown, heavy silty clay or clay, which cracks on drying and breaks into irregular-shaped lumps. This layer is underlain by yellow, mottled with reddish brown and light gray, heavy clay extending to a depth ranging from 18 to 24 inches. This material grades into yellow, mottled with rust brown and light gray or almost white, heavy plastic clay which extends to a depth ranging from 30 to more than 40 inches. Beneath this is the limestone rock. The subsoil and the underlying materials are extremely plastic and sticky when wet and very hard when dry. The dry material cracks and breaks into irregular-shaped lumps and finally crumbles to coarse soil particles.

In some wooded areas the surface soil is grayish-brown mottled with rust brown, heavy tough clay, and in a few places a very shallow covering of fine sand overlies the clay.

A large area is southeast, one is west, and a few small areas are northwest of Mud Creek School.

Colbert clay occupies flat level areas, gentle slopes, and low divides which slope gradually toward the drainage ways and generally occupies a slightly higher position than Colbert silt loam. Surface drainage for the most part is poor, especially on the flat areas, and internal drainage also is very poor, owing to the imperviousness of both surface soil and subsoil.

At present none of this soil is farmed, although some of it has been fenced and is used for cattle range. The forest growth is practically the same as on Colbert silt loam. Pasture grasses would

probably afford fair grazing, but it would be more difficult to seed the areas of this soil and maintain a good stand of grass than areas of Colbert silt loam.

The selling price of this land depends on the forest growth, as some good merchantable timber remains. The land is best suited to forestry and pasture.

COLBERT FINE SANDY LOAM

The surface soil of Colbert fine sandy loam is light-gray fine sandy loam, passing at a depth of 3 or 4 inches into grayish-yellow fine sandy loam which continues to a depth of about 8 or 10 inches. Below this is yellow or pale-yellow sticky fine sandy clay continuing to a depth of about 15 or 18 inches, where it grades into yellow or pale-yellow, mottled with rust brown and light gray, heavy plastic clay or silty clay. Between depths of 30 and 40 inches the gray mottling becomes more pronounced and the yellow color begins to fade out. The surface soil in many places contains rust-brown mottlings, especially in the flatter and more poorly drained areas. In the better-drained locations the surface soil is light brown or brownish yellow, and the subsoil is reddish-yellow plastic clay. Gradations of color occur, from the more poorly drained spots, which are gray, to the better-drained and higher-lying areas. A few soft black and dark-brown small accretions are present in the subsoil, usually between depths of 15 and 20 inches. In the areas south of Newburg varying amounts of platy shale and sandstone fragments occur in the soil, and in the areas to the north some rounded quartz gravel are noticeable.

Colbert fine sandy loam is one of the inextensive and unimportant soils in the county. The largest areas are in the northeastern corner, along the county line and north of Newburg, and a few small bodies are southeast of that town.

Areas of this soil are level or undulating, and in many places they slope very gently toward the stream channel. Natural surface drainage is poor, except on some of the slight elevations, and internal drainage is decidedly poor throughout all the areas. On some of the flatter areas water stands on the surface for considerable time after rains, and the alternate wetting and drying of the soil have deprived it of organic matter and produced a lifeless light-gray color and slight mottlings.

Probably not more than 8 per cent of Colbert fine sandy loam is under cultivation. The forest growth consists of water oak, willow oak, pin oak, red oak, white oak, swamp oak, hickory, elm, dogwood, maple, sweetgum, and black gum. Shortleaf pine predominates on the slight swells. The principal crop is corn which yields from 10 to 25 bushels an acre. Some cotton is grown on the knolls and slightly higher elevations. Sorgo produces from 50 to 70 gallons of sirup an acre.

The principal pasture grasses are carpet grass and Lespedeza, both of which do well. In addition to these, broom sedge, plantain, ragweed, goose grass, and many other coarse weeds and grasses flourish.

Colbert fine sandy loam is valued at present for its forest growth, the price of land ranging from $10 to $20 an acre according to the kind and amount of merchantable timber.

Under present economic conditions this soil can be used most profitably for timber production and pasture.

HOLLYWOOD CLAY

To a depth ranging from 6 to 12 inches, the surface soil of Hollywood clay consists of black clay which is extremely heavy, tough, and stiff when moderately dry and very plastic and sticky when wet. When dry the material cracks badly, breaking down into subangular particles resembling buckshot, thereby producing a somewhat coarse granular structure. The subsoil to a depth ranging from 15 to 20 inches is dark bluish-gray heavy clay, stiff when dry and plastic when wet. Most of this soil is very shallow, that is, in many places it consists of a layer, from 6 to 10 inches thick, of black clay resting on bluish-gray massive limestone rock. In many places outcrops of this rock are noticeable, and such areas are indicated on the soil map by rock-outcrop symbols.

Hollywood clay occurs in comparatively small areas. The larger bodies are on the north and south sides of the road leading from Russellville to Newburg. A fairly large area is west of Newburg, and several areas occur elsewhere in the limestone valley east of Russellville.

All areas of this soil are flat, lying noticeably lower than the adjoining Dewey soils. The land is naturally poorly drained, both on the surface and internally. Water penetrates the soil very slowly, and it is also given up slowly.

Most of the Hollywood clay is in forest consisting principally of cedar, hickory, white oak, red oak, persimmon, walnut, hackberry, and a few other hardwoods. Some of the land is in pasture, the native grasses including carpet grass, Lespedeza, and Bermuda grass.

A few small fields, especially where the soil is deepest, are devoted to corn, and the yield ranges from 20 to 40 bushels an acre. This is naturally a strong soil, but it is difficult to handle. Its best uses are for pasture and forestry, the more stony areas being suitable for forestry only.

KALMIA FINE SANDY LOAM

The surface soil of Kalmia fine sandy loam in cultivated fields consists of about 5 inches of gray or brownish-gray fine sandy loam, containing a small amount of organic matter, which grades into mellow and friable grayish-yellow fine sandy loam extending to a depth of 10 or 12 inches. The subsoil, to a depth of about 30 inches, is yellow or dull-yellow fine sandy clay which crumbles readily into a friable mass. This layer grades into light-yellow, mottled with white and rust-brown, fine sandy clay material which is rather hard and slightly compact but brittle. In slight depressions, where drainage is poor, the surface soil is dull-gray fine or very fine sandy loam, 2 or 3 inches deep, passing into pale-yellow or grayish-yellow, mottled with rust brown, fine sandy loam. The subsoil in these places is of a more or less mottled dull-yellow or grayish-yellow color. On the slightly higher areas the surface soil is grayish-brown or brownish-yellow fine sandy loam and the subsoil is brownish-yellow friable fine sandy clay. Some small rounded quartz gravel occur on the surface and in both the surface soil and subsoil in a few places, principally on the slight swells, and in the gravelly areas the surface soil is usually more brown in color.

This soil is developed on the second bottoms along Bear and Cedar Creeks. The largest area is immediately south of Halltown,

and a fair-sized body is southeast of Pogo. A few scattered areas occur in other places along these creeks.

Kalmia fine sandy loam occurs in level or undulating areas including a few slight swales, or depressions, and a few low hummocky ridges. Most of the soil has fair natural surface drainage which has been supplemented in places by open ditches.

All the land is either under cultivation or is used for pasture or hay fields. The principal crop is corn, and some cotton, sorgo, and hay are produced. Corn yields from 10 to 25 bushels with a possible average of 15 bushels an acre, the higher yields being obtained where legumes are used in rotation or nitrate of soda is applied. Cotton is planted on the better-drained areas and produces from one-fourth to as much as 1 bale an acre in good seasons, where an acre application ranging from 400 to 600 pounds of complete high-grade fertilizer is made. One farmer on this soil, who thoroughly prepared his land, obtained 1 bale an acre as compared with one-half bale on an adjacent field not so thoroughly prepared, using the same variety of cotton and the same amount and grade of fertilizer. Sorgo produces from 40 to 70 gallons of sirup an acre. A better-flavored and brighter sirup is produced on this soil than on some of the darker or heavier soils. Higher yields are obtained by a few farmers who have built the soil up to a higher state of productivity than the average. Lespedeza for hay is grown by a few farmers, and it does well, as does carpet grass and Bermuda grass.

Kalmia fine sandy loam brings from $20 to $30 an acre, depending on location and improvements.

For the improvement of this soil it is suggested that the slight swales and more poorly drained areas be thoroughly drained by open ditches; that the soil be plowed deeper and subsoiled; that large amounts of organic matter be incorporated; and that a crop rotation be practiced.

CAHABA FINE SANDY LOAM

The surface soil of Cahaba fine sandy loam consists of a 4 to 6 inch layer of brown or light-brown fine sandy loam, grading into light reddish-brown rather heavy fine sandy loam which continues to a depth of 8 or 10 inches. These two soil layers are friable and mellow, and render the soil easy to cultivate. The upper subsoil layer is mottled or streaked yellowish-red, brown, and dingy-white rather hard but brittle fine sandy clay, underlain by reddish-brown or yellowish-red clay which extends to a depth ranging from 40 to 48 inches. The material is friable and crumbles readily, breaking into irregular-shaped lumps and crushing into a friable mass. A few very small black specks or soft accretions are present in the surface soil in some places.

This is one of the soils of small extent in the county, but it is an important one agriculturally. It is developed on the second bottoms along Bear and Cedar Creeks, the largest single area occurring south of Pleasant Site. Several smaller areas are northeast of Red Bay and southeast of Halltown.

Areas of Cahaba fine sandy loam are level or undulating. The land lies slightly higher than the associated Kalmia fine sandy loam. All this soil has good natural surface drainage, as all areas slope gradually toward the lower-lying soils. All the land of this kind has been cleared for a long time and is used almost exclusively for the production of cotton, yields of which range from about one-fourth to 1 bale

an acre, depending on the season, kind and amount of fertilizer applied, and method of preparation and handling of the soil. Cotton is usually fertilized with from 200 to 600 pounds of a 3–9–3 fertilizer. This is the best second-bottom soil in the county for general farm crops, as it is easy to handle, responds readily to fertilizers, and is capable of being built up to a high state of productivity.

Cahaba fine sandy loam is usually sold in conjunction with, and enhances the value of, surrounding soils.

Recommendations for the improvement of Dewey loam will apply equally well to this soil.

HUNTINGTON SILT LOAM

The surface soil of Huntington silt loam, to a depth of 8 or 10 inches, is mellow and friable brown silt loam. The subsoil, extending to a depth ranging from 40 to 50 or more inches, is light-brown silty clay which is hard and brittle when dry, breaking into irregular-shaped lumps and finally crushing to a coarse-granular structure. In some of the lower-lying areas and swales the surface soil is very dark brown heavy silt loam or silty clay loam, and near some of the stream channels the surface soil is light brown and contains a large amount of very fine sand in some places. In the swales or old drainage channels the soil is slightly mottled with rust brown and contains some soft black oxide of iron concretions. In some places the dark color extends to a depth of about 3 feet without much change.

This soil is developed in the first bottoms along Spring, Mud, Little Mud, and Foxtrap Creeks. Some of the largest areas are north of Newburg. The areas are level or slope very slightly toward the stream channel. All the land is subject to overflow during freshets, but, for a first-bottom soil, most of it is well drained when the streams are at normal water level, although a few of the old stream channels or swales are poorly drained.

Probably 80 per cent of the land is cleared and the remainder is forested with oaks, hickory, gums, maple, willow, elm, sycamore, locust, ash, hackberry, and other hardwoods. Some switch cane grows in the wooded areas and along the stream banks.

Huntington silt loam is naturally one of the strongest and one of the most productive soils in the county. It consists of the finer material which has been washed from the Dewey, Decatur, and Colbert soils and brought down and deposited by the streams. It is an excellent corn soil, and corn yields range from 25 to 60 bushels an acre without the use of fertilizer or manure.

OCHLOCKONEE SILT LOAM

The surface soil of Ochlockonee silt loam is dull grayish-brown or dark-brown silt loam from 7 to 12 inches thick. The subsoil is grayish brown, with light-gray and rust-brown mottlings, ranging from heavy silt loam to sandy clay loam, and it is fairly friable and crumbly when dry. In some of the better-drained areas a rather uniform brown color continues from the surface to a depth ranging from 24 to 30 inches. In some places, particularly in the wetter areas, the subsoil is mottled dull-gray and rust-brown heavy silty clay loam.

This soil occurs in the first bottoms of Bear Creek, beginning as a rather wide belt at the State line and extending up the creek about 6 miles, the widest area lying northeast of Red Bay. Narrower strips

and smaller areas occur intermittently along this creek throughout its course in the county.

Much of the land lies only a few feet above the normal water level of the stream and is subject to frequent overflows, especially during the winter. Crops are seldom destroyed by overflows, but they may be damaged during the growing season.

About 70 per cent of the land is cultivated, and the remainder is forested with a variety of oaks, hickory, elm, ash, and gums. Corn is the principal crop and yields from 15 to 40 bushels an acre, the higher yields being obtained in good seasons and where the soil is thoroughly prepared. No commercial fertilizers are used for this crop. A few patches of sorgo and oats are grown by some farmers. The yield of sorgo is generally good and in favorable seasons the acre yield of oats ranges from 25 to 30 bushels.

OCHLOCKONEE FINE SANDY LOAM

The surface soil of Ochlockonee fine sandy loam consists of grayish-brown or brown fine sandy loam, to a depth of 2 or 3 inches, passing into brownish-yellow or light-brown fine sandy loam and continuing to a depth of 8 or 10 inches. The subsoil is light-brown or brownish-yellow fine sandy clay or clay loam, containing a few mottlings of gray which become more numerous at a depth ranging from 24 to 30 inches. In the lower and more poorly drained areas rust-brown mottlings are common in the surface soil, and the subsoil is grayish brown or rust brown with gray and rust-brown mottlings. Southeast and east of Russellville a few narrow strips of this soil have been influenced to some extent by material washed from the limestone soils, and here the surface soil and subsoil are darker brown, contain more fine material than typical, and the land is slightly more productive than some of the areas along Bear and Cedar Creeks farther west.

This soil occurs in the first bottoms along Cedar, Bear, and Little Bear Creeks. The largest areas are north and east of Red Bay on the north side of Bear Creek, an area begins at Pogo and extends southeastward for a distance of about 6 miles, and narrow areas occur along Cedar Creek east of Pleasant Site and south and southwest of Russellville.

The surface relief of Ochlockonee fine sandy loam ranges from flat to slightly undulating, with a very gradual slope toward the stream. Some of the land occupies rather high first-bottom positions, usually slightly higher than Ochlockonee silt loam. Although all the land is subject to overflow at times, a large part of it lies sufficiently high above normal overflow to be farmed without much danger of damage from overflows.

Probably 75 per cent of the land is cleared and cultivated. Corn is the main crop, and some cotton is grown on the higher and better-drained areas. The yield of corn ranges from about 15 to 30 bushels, with an average of 19 bushels an acre. Corn is seldom fertilized. Cotton yields from one-fourth to more than one-half bale an acre depending on the season, amount and grade of fertilizer applied, and degree of destruction from insect pests. Sweetpotatoes do well on the higher and better-drained areas, and soybeans, peas, and sorgo cane give fair returns.

ABERNATHY SILTY CLAY LOAM

The surface soil of Abernathy silty clay loam consists of reddish-brown silty clay loam to a depth of 5 or 7 inches, where it passes into red silty clay loam which extends to a depth ranging from 16 to 22 inches. The subsoil is steel-gray, bluish-gray with a slight yellow tinge, or mottled heavy sticky silty clay. The soil swells on wetting and cracks badly on drying. It has a tendency to break when dry into various sized and shaped lumps. Included with this soil as mapped are two areas of mine wash which consists of the fine material washed from the ore washers and deposited in basins, low dams being constructed to hold it. One such area is 3½ miles east and the other 2½ miles southeast of Russellville.

This soil consists of comparatively recent outwash of the fine material from the Decatur soils. It is developed in narrow strips along small streams heading in and flowing through Decatur clay loam areas. This is one of the soils of small extent in the county, and most of it is about 1½ miles east of Russellville and 2½ miles southeast of Russellville. It occupies first bottoms or depressions where streams head. Most of the soil is sufficiently well drained for the production of corn, oats, and grasses, and the more poorly drained areas are used for pasture.

Abernathy silty clay loam is naturally one of the most fertile and productive soils in the county. It is used mainly for corn, yields of which range from 30 to 60 bushels an acre. Oats yield from 30 to 50 bushels. The native grasses furnish excellent pasture.

All the land can easily be made very productive. The poorly drained spots can be drained by open ditches, and the seepage water from the upland can be cut off from these areas by ditches near the base of the slope. This is an excellent soil for growing silage and forage crops.

HARTSELLS VERY FINE SANDY LOAM

The 1 or 2 inch surface layer of Hartsells very fine sandy loam consists of gray very fine sandy loam carrying a very small amount of organic matter which gives the material a loamy feel. It is underlain to a depth of 6 or 8 inches by pale-yellow or grayish-yellow mellow and friable very fine sandy loam. In cultivated fields the surface soil is grayish yellow or yellowish gray to the depth of cultivation. The subsoil, extending to a depth ranging from 30 to 40 inches, is friable and crumbly brownish-yellow very fine sandy clay which breaks into irregular lumps and readily crushes into a fine granular mass. It is underlain by light-yellow very fine sandy clay mottled with white and rust brown. Included with this soil as mapped are a few small areas of Hanceville fine sandy loam, in which the surface layer is brown, the subsurface layer, brownish yellow, and the friable and crumbly fine sandy clay subsoil, red. A few small sandstone fragments occur in places. The areas of the Hanceville soil occur along the Colbert County line and south of Newburg at the headwaters of Cedar Creek.

Hartsells very fine sandy loam is one of the inextensive and unimportant soils of the county. The largest area occurs about 6 miles northeast of Russellville bordering the Colbert County line.

This soil occupies nearly level or gently sloping areas on the broad divides and gently sloping hillsides. It has excellent natural surface drainage and internal drainage is good, owing to the friable character of the subsoil and the underlying material.

Probably 40 per cent of the land is under cultivation, and the remainder supports a forest growth of shortleaf pine, post oak, red oak, black oak, black gum, a few hickory, and other hardwoods.

Cotton and corn are the principal crops, and oats, hay, sorgo, and vegetables are produced in a small way for home use. Peas and soybeans are grown for hay and give fairly good yields. Cotton averages about one-third bale an acre, but ranges from one-fourth to 1 bale. Yields of corn range from 10 to 30 bushels, with an average between 15 and 18 bushels.

This soil needs a large amount of organic matter which can be supplied by growing and turning under leguminous crops or by the addition of barnyard manure. The land is suited to the production of sweetpotatoes, potatoes, late truck crops, and peanuts.

HARTSELLS STONY LOAM

Hartsells stony loam has no uniform soil development except in a few restricted spots, where it consists of a gray or grayish-brown surface soil, ranging in texture from loam to fine sandy loam, and a subsoil which ranges in color from yellow or yellowish red to red and consists of friable fine sandy clay or fine sandy loam. Large sandstone rocks, bowlders, or outcrops and ledges of solid rock, together with, in many places, a mixture of rounded quartz gravel and sand are common over the soil. A few areas of Dewey stony loam and Colbert stony loam are included with this soil as mapped. These occur where the streams have cut down through the sandstone rock to the underlying limestone formation, as along Cedar Creek and in a few other places.

This soil occurs along Bear and Little Bear Creeks, along the northern escarpment of the high country immediately south of Cedar Creek, and near the headwaters of Cedar Creek. It occupies steep slopes, hillsides, and rough and broken country, but it is not quite so rough as the land classified as rough stony land. It has no practical agricultural value, and its value for forestry depends on the character and quantity of the forest growth. The principal tree growth consists of hickory, red oak, white oak, black oak, chestnut oak, post oak, black gum, poplar, elm, and shortleaf pine.

GUIN SOILS, UNDIFFERENTIATED

The Guin soils, undifferentiated, represent a class of materials so intricately mixed and occupying such rough and broken areas that no soil type separation could be accurately made. Perhaps 80 per cent of this material has somewhat the character of Atwood fine sandy loam, but there is much variation in the depth and texture of the surface soil. Mixed with the material are spots of Savannah, Hartsells, Dewey, and Colbert soils. In most places a large amount of small rounded chert and quartz gravel of different colors is on the surface and in the first 2 or 3 feet of the material, and in some places the material consists almost entirely of gravel which has accumulated in deep beds with very little fine material intermixed. All through the Guin soils, undifferentiated, large quantities of platy ferruginous sandstone, ranging from 1 to 4 inches in thickness, occur indiscriminately on the surface and to greater or less extent through the soil material at different depths below the surface, and in some places the surface is covered with brown or dark-brown ferruginous rock fragments. In places a large amount of sandstone conglomerate is scattered over the surface.

It is probable that this class of material is largely residue left by the streams which have cut down through the unconsolidated coastal-plain deposits into the sandstone and limestone in many places, and that the original materials have become badly mixed. Along some of the larger creeks the sandstone and limestone rocks have been deeply cut into, and outcrops are common on the steeper slopes in the deep valleys.

The Guin soils, undifferentiated, occupy a large part of Franklin County, especially the western half. Practically all the northwestern corner and much of the southwestern part is covered by this material, but small areas occur in all parts. This soil is developed along all the drainage ways and lies contiguous to their heads in all parts of the county, except in the limestone valleys east of Russellville. Freedom Hills, lying north and northeast of Red Bay, are included in this classification.

The surface relief of the Guin soils, undifferentiated, is the roughest and most broken in the county except a few of the almost perpendicular walls of rough stony land. The areas included in this classification comprise long narrow, winding ridges, and sharp knolls, peaks, and hills, with deep intervening V-shaped valleys. Much of the land is steeply rolling, hilly, and semimountainous. The streams are cut deeply, from 50 to more than 100 feet, below the tops of the hills.

Natural surface drainage of this land is excessive. In addition to the large streams which traverse the areas, numerous small streams, intermittent streams, and gullies ramify and dissect it. The run-off of rain water is very rapid, especially so where the leaf mold is burned annually, consequently the damage resulting from burning the vegetable matter is great. If this land were cleared, erosion would be extremely active and untold damage would result not only to this land, but to the bottom lands, which are now good agricultural soils but would be ruined by deposits of sand, gravel, and rock brought down and deposited by the onrush of water.

None of the Guin soils, undifferentiated, is under cultivation, because it is practically impossible to find an area sufficiently smooth to be economically farmed. The land was originally heavily forested, but practically all the merchantable timber has been cut. The present forest growth consists of shortleaf pine, some spruce pine on lower slopes or stream banks, blackjack oak, Spanish oak, chestnut oak, red oak, white oak, post oak, hickory, sweetgum, black gum, poplar, chestnut, chinquapin, dogwood, elm, maple, cedar, ironwood, birch, beech, haw, and plum, with an undergrowth of briers, grapevines, broom sedge, and various coarse weeds and grasses.

The only recommendation that can be made for the use of this land is forestry. In order to reestablish profitable tree growth, it is necessary to protect the region from forest fires. It would be better if all the Guin soils were owned by the Federal Government or State and placed in a forest reserve so that the trees could be looked after by forest rangers and protected from fires.

ROUGH STONY LAND

Rough stony land embraces areas, unsuitable for farming, consisting of blufflike mountain slopes and rather flat areas, locally known as "cedar glades" or "glade areas." The roughest and steepest areas of this material are on the northern escarpment of the high mountain-like or hilly area south of Newburg, along the north side of Cedar

Creek, west and southwest of Frankfort, and narrow strips occur along the valley walls of Bear Creek east of Hodges. In these areas numerous ledges or outcrops of sandstone or limestone rock occur, and piles of rock fragments, which have broken off the ledges, have accumulated in lower positions.

The glade areas form the greater part of what is mapped as rough stony land, and these occur indiscriminately throughout the limestone valleys, especially north and east of Russellville. Such areas consist of flat outcrops or table rock of hard limestone and occupy nearly level country, gentle slopes, and some low hills.

Only a small amount of soil material is included in the rough stony land areas, and it is very variable in color, ranging from the yellow color of the Colbert soils to the reddish-brown clay of the Dewey soils. A few spots of black clay occur locally between the rocks. None of the rough stony land can be cultivated and only a small percentage of it can be used for pasture.

The forest growth on the limestone areas consists principally of hardwoods, such as red oak, white oak, black oak, post oak, hickory, birch, elm, sycamore, ash, poplar, dogwood, cedar, black gum, and sweetgum, and the growth on the sandstone areas along Bear Creek is principally shortleaf pine. Most of the merchantable timber has been cut.

The value of this land is based almost entirely on the character of the forest growth. It sells from $5 to $10 an acre where not included with agricultural soils.

MEADOW

Meadow occurs in places in the first bottoms along Hurricane, Tollison, Dunkin, and Chisholm Creeks and as very narrow strips along some of the branches and streamlets of the county. It is so variable in texture, color, and structure that no definite soil type name could be assigned to it. It is subject to overflow and during part of the year is saturated.

Meadow consists of materials washed from the uplands and deposited during times of heavy rainfall. Most of the material has been washed from the Guin soils, undifferentiated, and the more sandy soils of the county.

The principal use of meadow is as summer pasture for cattle. A few small fields are devoted to corn and sorgo, and fair yields are obtained. If the land were drained and reclaimed more of it could be successfully used.

SOILS AND THEIR INTERPRETATION

Franklin County lies in the northern part of the State of Alabama, in the most northern part of the the coastal-plain region and in the limestone valleys. Probably 75 per cent of the soils in the county owe their origin to coastal-plain material. This county embraces a large area of extremely rough and broken land. The northeastern quarter of the county is principally in the limestone-valley region where the surface relief in places is comparatively smooth. The elevation of the coastal-plain section is between 700 and 800 feet and that of the limestone-valley section is between 400 and 600 feet above sea level.

Most of the soils are light colored, ranging from light gray to brown and reddish brown. Exceptions to these prevailing colors are in

small areas of Hollywood clay, in which the surface soils are almost black, in some of the first-bottom soils which are dark brown, and in a small percentage of the limestone soils which are reddish-brown. Conditions have not favored the accumulation of organic matter and, with the exception of the dark-colored soils mentioned, most of the soils are deficient in organic matter. Throughout the forested parts of the county a small amount of vegetable mold is on the surface or mixed with the first inch or two of the soil, but this is soon exhausted when the soils are cultivated. No grass-covered areas were in this county to produce black soils similar to those in the Middle West.

In this region of rather heavy rainfall and warm temperature active leaching continues throughout the greater part of the year, because the soil is not frozen to any extent as it is in many States farther north. This washing out of the soluble mineral elements and the removal of organic matter largely accounts for the fact that the surface soils are light colored and do not contain so high a percentage of mineral plant food as do the subsoils. Owing to this leaching, carbonate of lime has not accumulated, although calcium is present in the soil material and some of the limestone soils have been derived from pure limestone. However, practically all the soils of the county are acid in character.

The parent soil-forming material consists of unconsolidated beds of various-colored clays, sandy clays, and sand and gravel beds throughout the coastal-plain section of the county, and these materials have given rise to the Atwood, Savannah, and Red Bay soils.

In the limestone region there is pure limestone, some cherty limestone, and limestone conglomerate. The pure limestone in many places lies from 1 to 5 feet below the surface and even outcrops over extensive areas, whereas the limestone conglomerate and cherty limestone have a much thicker covering of weathered material and may lie from 5 to 30 feet below the surface. The pure limestone has produced the Colbert, Hollywood, and part of the Dewey and Decatur soils, and the conglomerate and cherty limestones have given rise to, or influenced in part, the Dewey and Decatur soils. Throughout the coastal-plain section of the county are extensive areas of extremely gravelly soils and gravel beds ranging from 2 to 30 feet in thickness, and part of the Dewey gravelly fine sandy loam contains a high percentage of gravel. In a few places sandstone is present, and from this have developed the Hartsells soils.

In a region of such broken, hilly, and steep relief and where erosion is so pronounced, a normal soil profile, or mature soil, has not been developed except in restricted areas. The most striking features of the texture profile of the well-developed, or normal, soils in the county is the presence in most of them of a comparatively light-textured surface horizon, overlying a deeper heavier-textured horizon, and a still deeper third horizon which may vary considerably in texture, but which is prevailingly lighter textured than the second horizon, or the typical subsoil. The thickness of these horizons ranges widely, the surface horizon ranging from a few inches to as much as 12 inches in the most sandy soils.

The most mature soils are those with a normally well-developed soil profile in the virgin areas and they include all soils of the Atwood, Savannah, Red Bay, Hartsells, Decatur, Dewey, and Cahaba series. This group may be subdivided according to the color of the A and B horizons. The first group includes the soils of the Decatur, Dewey,

and Red Bay series having a color profile about as follows: A reddish-brown or light-brown surface layer and a red or yellowish-brown subsurface layer, these two layers constituting the A horizon. The second group comprises the soils of the Savannah, Hartsells, Atwood, and Cahaba series. In these soils the two layers of the A horizon are a dominantly gray or grayish-brown light surface layer, from 1 to 3 inches thick, and a pale-yellow or yellow subsurface layer in the Savannah and Hartsells soils, a brownish-yellow subsurface layer in the Atwood soils, and a light reddish-brown subsurface layer in the Cahaba soils. The B horizon of the Savannah and Hartsells soils consists of friable and crumbly yellow fine sandy clay, and the B horizon of the Atwood and Cahaba soils is friable and crumbly yellowish-red or reddish-brown fine sandy clay.

The C horizon, or parent material, underlying the uniformly oxidized A and heavy B horizons of all the soils of the two groups, consists of material which is variable in color, texture, and structure. The thickness of this horizon also varies greatly, being shallowest where it overlies sandstone and limestone. The C horizons of the Decatur and Dewey soils consist of red, mottled with yellow, rather compact heavy material containing a few small soft rounded black concretions and some comparatively soft white limestone fragments. In places the parent material is deep yellow, or mottled red, yellow, and gray. The C horizons of the Atwood and Cahaba soils consist of mottled reddish-brown, white, and yellow fine sandy material, and the C horizons of the Savannah and Hartsells soils are gray with white and yellow mottlings.

Profile descriptions of some of the normally well-developed or mature soils at definite locations in the county are given.

Atwood loam, Atwood loam, hilly phase, and Atwood gravelly loam are mapped in Franklin County, and the soils of the series conform in color and structure to the following description:

In Atwood loam, located 1 mile southwest of Union Hill Church, the A_1 horizon, from 0 to 1 inch, consists of dark-gray loam containing a large amount of organic matter, and the A_2 horizon, from 1 to 8 inches, is light brownish-yellow mellow and friable loam. Both of these layers contain a large amount of silt and a very small amount of very fine sand. The B_1 horizon, from 8 to 28 inches, is dull-brown or reddish-brown light clay or heavy clay loam, uniform in color throughout. A cut surface appears yellow or brownish yellow. The material breaks up easily and readily crumbles into a fine mass. The B_2 horizon, from 28 to 50 inches, is yellowish-brown or reddish-brown clay mottled with bright yellow and purplish red. The material is very compact and hard but extremely brittle and when crushed breaks easily into irregular lumps. The yellow mottlings are pronounced in the lower part of the layer. The C horizon, from 50 to 60 inches, is mottled yellow and reddish-brown hard compact brittle and crumbly fine sandy clay.

In Savannah loam, located 1 mile northwest of Spruce Pine, the A_1 horizon, from 0 to 2 inches, is gray loam carrying a small amount of organic matter, and the A_2 horizon, from 2 to 8 inches, is grayish-yellow mellow and friable loam. These layers constitute the A horizon which contains a high percentage of silt. The B_1 horizon, from 8 to 26 inches, is brownish-yellow friable clay or heavy very fine sandy clay. It is uniform in color, breaks up easily, having no definite breakage lines, and crumbles into a fine mass. The B_2 horizon,

from 26 to 32 inches, is dull brownish-yellow and light-gray compact hard and brittle very fine sandy clay which is slightly stratified and breaks into flakes. It is difficult to penetrate this layer with a soil auger, but the material crushes readily. This layer is very distinct in the typically developed areas of Savannah loam. The C horizon, from 32 to 60 inches, begins as mottled reddish-brown and yellow, with a small amount of light gray, hard compact but friable very fine sandy clay material. It becomes more friable and very crumbly between depths of 50 and 60 inches but is still slightly compact.

A characteristic profile of Red Bay loam, the only member of the series mapped in Franklin County, is as follows: From 0 to 2 inches, dark-brown fine sandy loam containing organic matter; from 2 to 8 inches, mellow and friable reddish-brown loam; from 8 to 12 inches, reddish-brown clay loam which is rather heavy but crumbles fairly easily; and from 12 to 72 inches, red friable rather heavy and stiff fine sandy clay which breaks into irregular lumps and finally crumbles to a fine-granular structure. The color is uniform along breakage lines and across soil particles, but the cut surface is lighter. From 72 to 108 inches is yellowish-red hard compact fine sandy material which is brittle but crumbles into fine sand. The material of this layer has no definite structure. From 108 inches downward is yellow or reddish-yellow hard compact fine sandy material.

A characteristic profile of soils of the Decatur series, in which Decatur clay loam and Decatur clay loam, mined phase, are mapped, is as follows: From 0 to 3 inches, dark reddish-brown heavy loam containing considerable organic matter; from 3 to 8 inches, reddish-brown clay loam which is mellow and friable when dry, and sticky when wet; and from 8 to 48 inches, deep-red or maroon-red rather heavy clay which is sticky when wet but when moderately dry breaks into irregular-shaped lumps and finally crushes into subangular soil aggregates ranging in size from about one thirty-second to one-fourth inch. The color along breakage lines and around soil aggregates is a uniform deep red, but the inside of the aggregates is a lighter shade. The cut surface appears lighter red than the broken surface. From 40 to 72 inches and deeper is friable and crumbly red clay which is much lighter in texture than the overlying material. Below this is mottled and streaked reddish-brown and yellow rather compact but friable material. Throughout the soil profile are numerous black soft iron or manganese concretions or pebbles ranging from about one-sixteenth to one-fourth inch in diameter. The highest percentage of these particles is in the upper subsoil layer. A few smooth rounded quartz and chert gravel occur throughout the surface soil and subsoil. The material of the C horizon is very variable, ranging in color from deep yellow to red and a mixture or variation of these colors.

The Dewey series is represented in this county by the loam, fine sandy loam, and gravelly fine sandy loam members. A characteristic profile of soils of this series is described as follows: From 0 to 2 inches, dark-brown loam containing organic matter; from 2 to 8 inches, friable and mellow light-brown loam; and from 8 to 45 inches, reddish-brown clay which readily breaks into irregular-shaped lumps and crushes to a fine-granular structure. The material is uniform in color along breakage lines and in the soil particles. From 45 to more than 55 inches is hard but brittle brown material, mottled with white spots and black iron stains. The underlying limestone is reached at a depth ranging from 6 to 10 feet.

The Hartsells series includes the very fine sandy loam and stony loam members in Franklin County. A representative profile is as follows: From 0 to 1 inch, gray very fine sandy loam containing a slight amount of organic matter; from 1 to 6 inches, pale-yellow or grayish-yellow mellow and friable very fine sandy loam; and from 6 to 32 inches, brownish-yellow heavy fine sandy clay which breaks into irregular-shaped lumps and readily crushes into a fine-granular mass. The color throughout the soil particles is uniform. From 32 to 48 inches and deeper is mottled light-yellow, white, and rust-brown very fine sandy clay material.

The Cahaba series includes only one soil type in Franklin County, the fine sandy loam. Following is a description of a characteristic profile of this soil: From 0 to 4 inches, brown fine sandy loam; and from 4 to 10 inches, light reddish-brown fine sandy loam. These two layers are friable and mellow. From 10 to 48 inches is friable and crumbly reddish-brown light clay which breaks easily into irregular lumps and crushes readily. The color is uniform throughout this layer with the exception of a few small black specks. From 48 to more than 50 inches is mottled and streaked yellow, reddish-brown, and white rather hard but brittle fine sandy clay material.

The second group of soils includes those in which a normal or mature profile has not developed, and it comprises the soils of the Colbert and Hollywood series of the uplands and of the Kalmia, Huntington, Ochlockonee, and Abernathy series of the bottoms. The Colbert soils have gray, brownish-yellow, or grayish-yellow surface soils and yellow or brownish-yellow heavy plastic clay subsoils. The Hollywood soils, which are closely associated with the Colbert, have very dark gray or almost black surface soils and bluish-gray heavy plastic sticky clay subsoils. The underlying pure limestone rock is in few places more than 3 or 4 feet below the surface and in many places is much nearer and even outcrops.

Soils of the Kalmia series are not well developed in Franklin County, and the profile of Kalmia fine sandy loam does not conform exactly to that of the large areas of Kalmia soils farther south in the State. The surface soil is gray, and the subsoil is yellow or brownish yellow. This soil has developed on the bottoms and terraces.

The first-bottom soils in Franklin County differ considerably in color and structure, depending on the character of the upland material from which they have been derived. They consist for the most part of the finer materials which have been washed from the uplands and deposited by the streams during overflows. In many places they are in the process of soil making, that is, they are subject to change by the addition of new material deposited during overflows or by the removal of some of the present surface soils.

The soils of the Ochlockonee series have brown or grayish-brown surface soils and gray, mottled with yellow and rust brown, subsoils. These soils have been washed mainly from areas of Atwood and Savannah soils.

The soils of the Huntington series have dominantly brown surface soils and light-brown subsoils. The material forming these soils has been brought down by streams flowing through areas of Dewey and Decatur soils. The soils of the Abernathy series differ from the Huntington soils in that the surface soil material is red and the subsoil is drab heavy silty clay. These soils represent recent wash of the fine material from the hills covered by Decatur clay loam. They

have been transported only a short distance and in some places have simply washed down into depressions.

In addition to the established soil types three classifications of miscellaneous materials are mapped. These are Guin soils, undifferentiated, which occupy a large part of the county; meadow, which is the mixed material along the streams; and rough stony land, which is very rough, steep, and stony.

SUMMARY

Franklin County is in the northern part of Alabama, bordering the Mississippi State line. It includes 647 square miles.

The Jackson Highway crosses the county from north to south, passing through Russellville, the county seat. A branch of the Illinois Central Railroad crosses the southwestern corner of the county, and a branch of the Southern Railway traverses the east-central part in a north and south direction.

The winters are comparatively mild, and the summers are long but not excessively hot. The average frost-free period is 193 days.

The surface features of the county are mainly rough and broken, except in the limestone valleys in the northeastern corner. Practically all the land in the western half of the county is hilly, rough, and broken. The southeastern corner includes some broad fairly smooth interstream areas with narrow valleys having steep slopes. The smoother upland areas comprise the limestone valleys and lie east of Russellville. Natural drainage is good over most of the smoother areas and excessive over the rougher parts of the county.

The principal crops grown are cotton and corn, and a small acreage is devoted to oats, sorgo cane, peas, and peanuts. Cotton is the staple money crop, but scarcely enough corn is grown for home consumption. No attempt is made to cultivate the extensive hilly and broken areas of the county.

A number of different soils were recognized and mapped, and these can be divided into four groups as follows: (1) The limestone-valley soils occur in the northeastern corner and occupy about 10 per cent of the area of the county. The surface soils of these soils range in color from light gray to dark red and the subsoils range from fairly heavy clays to yellow heavy plastic clays. Soils of the Dewey and Decatur series are the best agricultural soils in this region. (2) The soils with light-gray or red loam surface soils, and yellow, yellowish-red, or red friable sandy clay subsoils occur in the southeastern corner and in small areas in the southern and southwestern parts of the county. These are the principal cotton-growing soils. (3) A few well-developed second-bottom soils and long strips of first-bottom soils along the larger creeks in the county. Most of these soils are cultivated to cotton and corn. They constitute some of the most productive soils. (4) The Guin soils, undifferentiated, occupy a large part of the western half of the county and the steep slopes and valley walls in the southeastern and southern parts. These soils are badly mixed and no definite soil type could be accurately mapped. Practically all of this land is in forest.

Considerable revenue is obtained from the sale of timber, crossties, and stave bolts. In the vicinity of Russellville, mining operations are important. A large acreage, particularly of the Guin soils, should be in forest reserves.

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[PUBLIC RESOLUTION—No. 9]

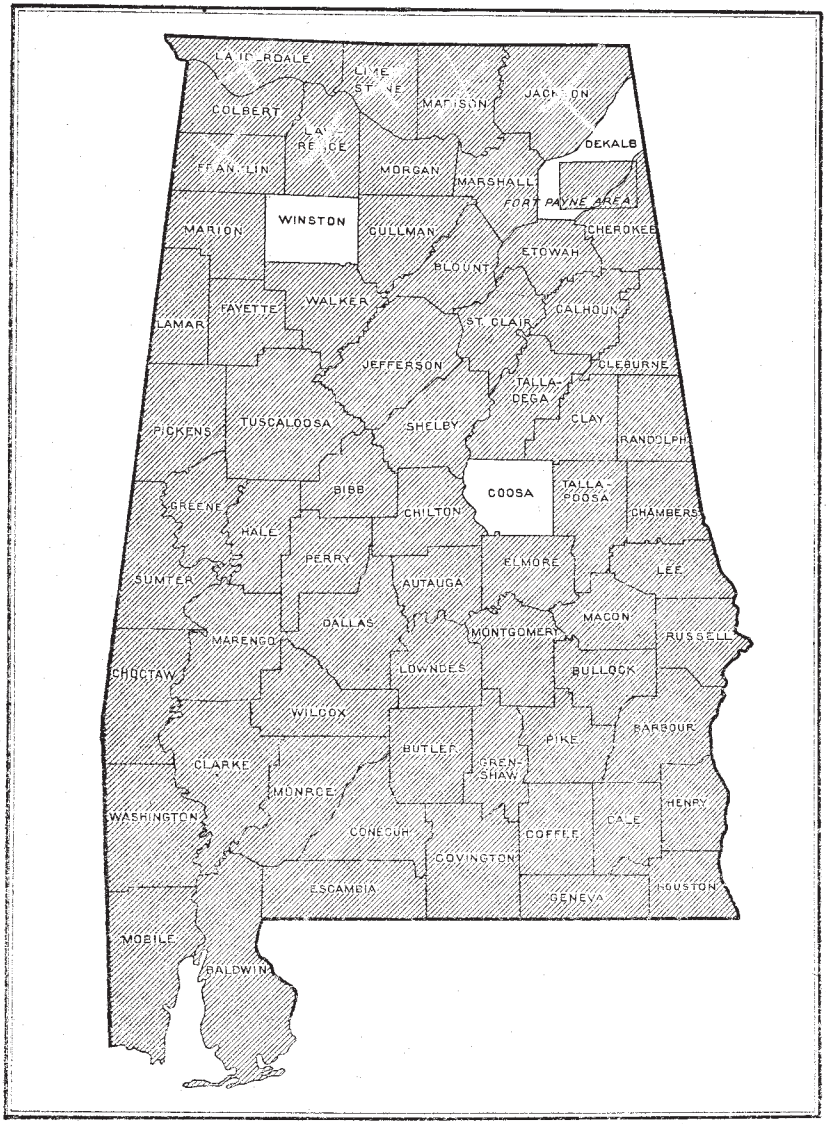
JOINT RESOLUTION Amending public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, "providing for the printing annually of the report on field operations of the Division of Soils, Department of Agriculture."

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, be amended by striking out all after the resolving clause and inserting in lieu thereof the following:

"That there shall be printed ten thousand five hundred copies of the report on field operations of the Division of Soils, Department of Agriculture, of which one thousand five hundred copies shall be for the use of the Senate, three thousand copies for the use of the House of Representatives, and six thousand copies for the use of the Department of Agriculture: *Provided,* That in addition to the number of copies above provided for there shall be printed, as soon as the manuscript can be prepared, with the necessary maps and illustrations to accompany it, a report on each area surveyed, in the form of advance sheets, bound in paper covers, of which five hundred copies shall be for the use of each Senator from the State, two thousand copies for the use of each Representative for the congressional district or districts in which the survey is made, and one thousand copies for the use of the Department of Agriculture."

Approved, March 4, 1904.

[On July 1, 1901, the Division of Soils was reorganized as the Bureau of Soils, and on July 1, 1927, the Bureau of Soils became a unit of the Bureau of Chemistry and Soils.]



Areas surveyed in Alabama, shown by shading

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U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF CHEMISTRY AND SOILS
HENRY G. KNIGHT, CHIEF
A. G. McCALL, CHIEF, SOIL INVESTIGATIONS
CURTIS F. MARBUT, IN CHARGE SOIL SURVEY

SOIL MAP
FRANKLIN COUNTY
ALABAMA

ALABAMA DEPARTMENT OF AGRICULTURE
AND INDUSTRIES
S. M. DUNWOODY, COMMISSIONER

W. Edward Hearn, Inspector, District 2.
Soils surveyed by J. F. Stroud, Alabama Department of Agriculture and Industries, in charge, and B. H. Williams and W. W. Strike, U. S. Department of Agriculture.

BASE MAP IN PART FROM
U. S. GEOLOGICAL SURVEY SHEETS

Scale 1 inch - 1 mile

Field Operations
Bureau of Chemistry and Soils
1927